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HONS 497  
Honors Thesis

Equine Misbehavior and its Relationship to Temperament and Rider Induced Stress

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March 30, 2015

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Primary Advisor Signature\_\_\_\_\_

Department of Agriculture

Abstract

The goal of this study was to determine if there was a relationship between horse temperament and incidence of misbehavior due to the stress of being ridden by riders with a wide range of ability during the course of a summer camp season (9 weeks). It was hypothesized that horses with a social or aloof temperament would be able to adjust with more ease, while those with a fearful or challenging temperament would have a higher incidence of misbehavior. Each horse was evaluated for temperament at the beginning of the summer camp season. In the following weeks every rider was evaluated for rider skill level; their skill level, the lengths of trail rides, and incidences of horse misbehavior on those rides were all recorded. The rider skill level was multiplied by the length of the ride in minutes to develop a stress index. A significant relationship ( $p < .0001$ ) between equine stress levels and the level of misbehavior was shown to vary by temperament with a lower incidence of undesirable behavior exhibited by the social and aloof horses.

### Introduction

In the world of the summer camp horse barn, many barn staff feel that their horses progressively exhibit more misbehavior the further into the camp season they progress. This conception of increasing equine contrariness stimulated the idea that each individual horse's temperament could affect the way it performs in a summer camp setting. By using the work done by Barteau, a rubric was created to categorize each horse in the Timber Ridge Camp riding program into their respective temperaments of Challenging, Fearful, Social, and Aloof (Figure 1.1).

Temperament can be defined as a person's or animal's nature, especially as it permanently affects their behavior; meaning that—barring an extremely traumatic experience—a horse's temperament would not change, and its actions or reactions to different situations may be predicted. Barteau introduces the four horse temperaments using the example of foals<sup>1</sup> in a field with their mothers.

“Three of the youngsters have already spotted you. One has retreated to the far side of her mother, where she cautiously watches you from under the mare's belly. Another, who appeared both interested and alert at your arrival, is making his way determinedly toward your jacket. Upon reaching it he wastes not time before mouthing it, grabbing it, pulling it off the fence, and happily shaking it around. Another youngster stands at some distance from her mother. She has not moved much at all since you first appeared; in fact she seems neither interested nor intimidated by the proceedings. The last of

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<sup>1</sup> A foal is a young horse, male or female, one year old or younger, in this case the foals are not yet weaned from their mothers' milk and are therefore likely six months or younger.

the group, with all the swagger of a school-yard bully, rushes in to grab and then argue about who should keep the jacket” (Barteau, 3).

This illustration accurately sums up the four equine temperaments that are observable even at a young age. Barteau goes on to describe the characteristics of each temperament using categories such as adaptability, interaction, reactivity, and tolerance to distinguish each of the four temperaments.

By marking the sections on the rubric that correspond with the observed horse’s behavior, one can easily type for a temperament. Though a horse may exhibit aspects of multiple temperaments, the majority of marks will fall under its actual temperament. Some horses are easier to temperament type than others. In Figure 2.1 the horse Lady is displayed. It is easy to discern that Lady is a fearful horse. Even though two areas of the rubric also place her in the social temperament that does not negate the overwhelming evidence that Lady is a fearful horse. This extreme case is considered aggressively fearful, meaning that her temperament is very easy to observe.

The other side of the curve is the horse with a passive temperament. Figure 2.2 displays Beauty’s temperament test, which exhibits how difficult it can be to type a passive horse. However, as formerly stated, the majority of marks reside in the challenging column. The slight overlap between aloof and challenging also makes it easier to characterize Beauty as a passively challenging horse. Aloof horses are less reactive and more tolerant, and these same characteristics can show up in more passive versions of reactive temperaments. Close relationships between two

temperaments allow the observer to discover how a passive temperament interacts differently than its aggressive counterparts.

For each horse three things were observed and recorded during the summer camp season (9 weeks): The skill level of that horse's rider (Figure 1.2), how long the horse was exposed to that specific rider (trail-ride length), and what incidence and severity of equine misbehavior occurred on the trail ride (Figure 1.3).

The skill level of the rider influences the amount of stress a horse experiences. Work done by Hausberger et al indicates that horses not only experience stress, but that this stress may cause behavioral disorders. When exposed to negligent or untrained riders, poor behavior may be encouraged accidentally and then reinforced by a rider's lack of control. This means that horses with less tolerance of poor treatment are much more likely to develop and persist in undesired behavioral expression as a stress outlet or as an attempt to escape the poor treatment.

Blokhuis asserts "A correct seat and position are the basis for a good performance in horseback riding" (Blokhuis, 191). This means that in order for a rider to have correct and open communication with their mount they must exhibit proper riding posture and technique. It is for this reason that equestrian instructors put young riders on less reactive or bombproof horses;<sup>2</sup> these horses allow the instructor to assist the rider in learning proper positioning and communication without the added worry of injury to the student. This lessened reactivity and

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<sup>2</sup> Bombproof is a term used in the equine world to indicate that a horse does not react to anything. The term comes from the idea that a bomb could go off right next to the horse and they would not react.

relative safeness results from the horse being more tolerant of accidental subpar treatment by a learning rider. Since a novice rider causes more confusion and frustration to a horse—due to their lack of experience and knowledge—a novice is ranked as a level 4 in comparison to an advanced rider at a level 1. This ranking designates lower numbers as less stress and greater numbers as more stress when the rider level is multiplied by the time exposed.

The horses were also observed through their camper and staff interaction to determine if a correlation existed between incidence of misbehavior and that horse's temperament. Misbehavior is the designated measure of stress expression in this experiment. Horses that are unstressed or that cope better with stressful situations do not have a tendency to misbehave. Misbehavior is the expression of any behavior that is undesired or considered dangerous.

Misbehavior is divided into 3 main levels, designated as numbers 2-4 in Figure 1.3. Level 2 is defined as an annoyance; horses often use these behaviors (ear pinning, tail swishing, etc.) to convey their unhappiness or annoyance with another horse or with a situation. Of the misbehaviors these are the mildest form. Even a novice rider can handle most behaviors in level 2; in fact some of these signs may even escape their detection.

The next level of misbehavior, level 3, is categorized as disruptive; these behaviors (balking<sup>3</sup>, kicking, etc.) cause momentary holdups on trail rides. Though these misbehaviors can be easily dealt with by more experienced riders, novice

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<sup>3</sup> Balking is the refusal of a horse to move forward on command.



riders may have difficulty understanding how to control their mount and often need extra guidance from their instructors to avoid any misbehavior escalation.

The final level, misbehavior level 4, refers to the hazardous expressions of stress (bucking, rearing, bolting)<sup>4</sup>. These behaviors can be extremely dangerous even for more experienced riders. If a correlation exists between temperament and misbehavior, these behaviors, as well as the less severe, can hopefully be reduced due to the reduction of rider stimulated stress.

This project uniquely views equine temperament as more than a casual aspect of the horse, it investigates how specific temperaments may make the job of a summer camp trail and lesson horse more stressful to the animal and therein cause more of a hassle for its handlers.

The goal of this study is to determine if and how temperament affects a horse's behavior—or ability to cope with stress—in the summer camp environment, and how to prevent the acquisition of unsuitable horse temperaments that will likely cause increased injury to young inexperienced riders. It is predicted that horses with social or aloof temperaments will be able to adjust with more ease to the variance of riders and rider skill than horses with challenging or fearful temperaments; meaning that social and aloof horses experience less rider related stress and therefore are less likely to exhibit misbehavior due to the stress of rider variety and incapability.

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<sup>4</sup> -Bucking is when a horse puts its weight on the forelegs, kicking both hind legs upwards; this often sends riders over the horse's head  
-Rearing is where a horse sits its weight on the hind legs, raising the forelegs into the air; this often sends a rider off the back of the horse.  
-Bolting is the swift change in speed from slow to fast that is out of rider control

### Methods

To evaluate the level of correlation between temperament and misbehavior three things were observed and recorded per horse: the skill level of each horse's rider, how long the trail ride was, and any horse behavior problems encountered on the trail ride. These recordings were done using the researcher's phone (voice record and timer) these three quantities were then used to measure stress and its correlation to stress expression (misbehavior). The stress scale per horse was measured using rider skill level multiplied by the time (in minutes) that a horse was exposed to that level of rider; those individual trail ride numbers were then added up for a summer stress total per horse. The rider skill scale measured an experienced rider as a 1 with a novice rider as a 4, due to the research on rider seat and horse behavior (Blokhuys). This means that horses with higher numbers experienced more stress during the summer. The misbehavior on trails was counted as expressions of stress either from that specific rider or built up over time. Since the horses created their own trails and graze the pasture and trails that are traversed for trail rides, environment was not considered to be a stressor.

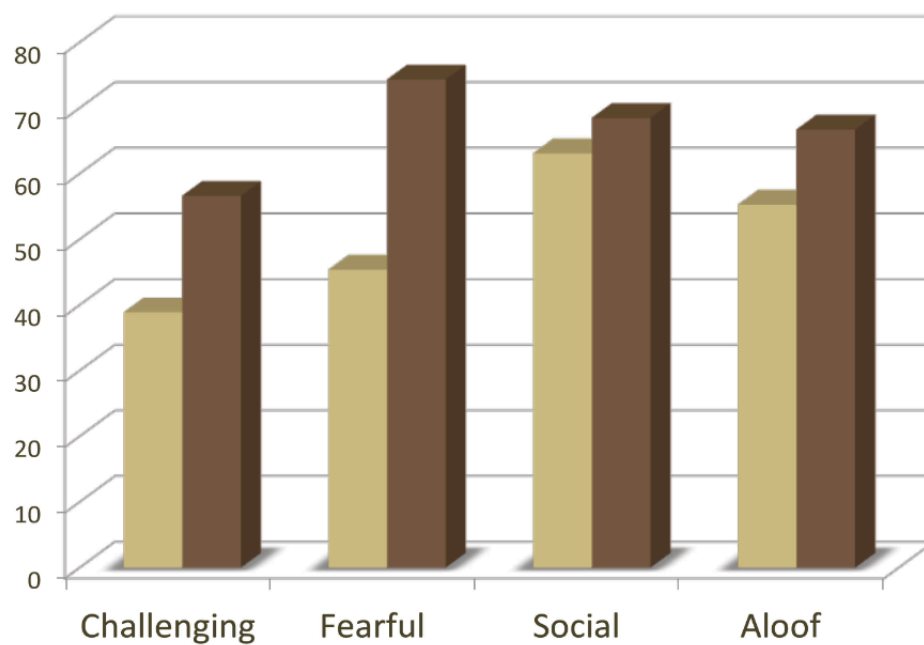
### Results

One-way ANOVA showed a highly significant ( $P < .0001$ ) relationship between the stress index and the incidence of misbehavior. The behavior scale data for any misbehavior were combined due to lower frequency of severe misbehaviors 3 and 4 so that now 1 equaled no misbehavior and 2 equaled any misbehavior. This lowered frequency is likely due to instructor judgment and experience; to prevent hazardous incidents instructors attempt to match campers with horses that will

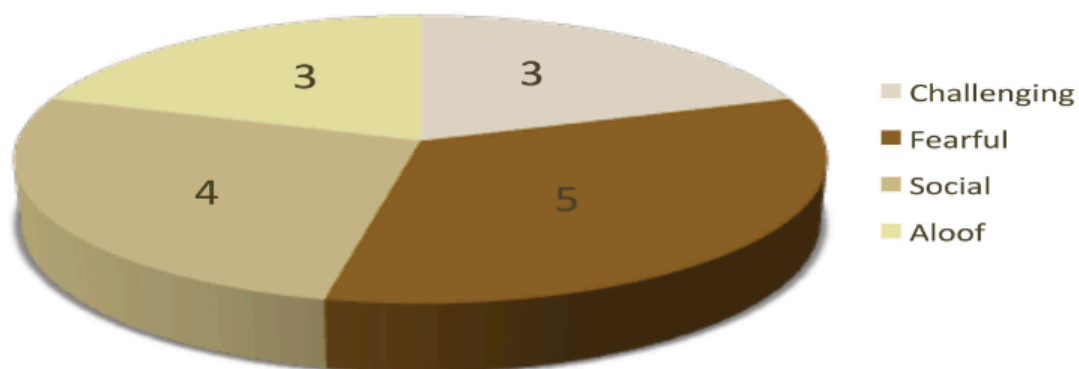
tolerate their riding level, this does not always happen however, due to the camps longstanding tradition of allowing campers to choose their own horse within reason.

Horses with a challenging temperament exhibited significantly more misbehavior ( $P=.007$ ) as did horses with a fearful temperament ( $P<.0001$ ). Horses with social or aloof temperaments did not show significant increase in misbehavior (Graph 1.1). The slightly lower significance in the correlation of challenging temperament and behavior compared to the correlation of fearful temperament and behavior could be due to one of the three challenging horses consistently ridden by a level 1 staff member who has been working with that specific horse for two years. The lower herd number (15) is definitely a detriment to the study, and repeating the study with a larger herd is recommended to ensure veracity. However, although the herd was small, the distribution of temperament was fairly equal (Graph 1.2).

**Graph 1.1**  
***Misbehavior by Temperament***



**Graph 1.2**  
***Herd Temperament Distribution***



### Discussion

The results support that in a summer camp horse program a positive relationship exists between stress and misbehavior of horses, and this in turn varies by their temperament ( $P=.02$ ). Horses with fearful or challenging temperaments appeared to be more stressed than horses with a social or aloof temperament based on the greater incidence of misbehavior. This confirms the hypothesis that horses with social or aloof temperaments would be able to adjust to the variance of riders and rider skill with more ease than those with challenging or fearful temperaments.

It is therefore recommended that horses be temperament tested before entering a summer camp program; horses with temperaments better adapted to a camp environment would likely reduce incidence of injury to campers and the liability of the camp. Temperament testing using the rubric pictured (Figure 1.1) allows for quick but accurate temperament typing despite the potential for a horse to exhibit these temperaments passively or aggressively. Horses who have a more passive temperament may appear to be more aloof than anything else, however with careful observation even passive horses can be observationally placed in their respective temperament types.

Summer camps utilizing the temperament typing method would therefore be able to ascertain which horses are social and aloof—which would be preferred for a camp program—while avoiding the challenging or fearful horses that do not cope as well in a camp environment. This is not to say that challenging and fearful horses cannot excel or should be avoided completely, but such horses require special care. Fearful and challenging horses are less tolerant of poor treatment, fearful horses

will respond adversely out of fear, and challenging horses will take control of the situation, causing loss of rider control. However, experienced riders when working consistently with horses of fearful and challenging temperaments can succeed. These temperaments are better suited to being singly ridden; it gives the horse either a sense of security or allows for the continual assertion of rider control. Thus for a summer camp program with many riders per day and possibly a different rider each trail ride, horses of social and aloof temperaments are better suited to cope with the variance.

In future studies of equine temperament, it is recommended that steps be taken to obtain more data specified towards social and aloof horses. For example, when forming a herd for observation, if the herd is completely social and aloof horses it will provide data regarding how herd position and pecking order may influence levels of misbehavior. Ideally a herd of social and aloof horses would be a peaceful herd and there would be continued insignificance between their temperament and levels of misbehavior. However, it is possible that due to the lack of some of the 'bossier' challenging horses the social and aloof horses may end up exhibiting more misbehavior than is currently predicted.

Another study that could be done would be using riders of varying skill levels and randomly placing them on horses of various temperaments horses in an arena trail course. This allows a more keen observation of how differing riders and levels of riders affect their mounts while simultaneously maintaining a trail-like environment. This method also introduces an extra protective layer for the rider by keeping horse and rider in a more confined and manageable space with less chance

that a horse will run off with a rider. This study also allows the instructor to be grounded instead of leading the trail ride, offering them better observation of both rider and horse.

### Acknowledgments

Dr. Jerome Thayer of the Center for Statistical Services assisted in all the analysis of my data, I would have been hopelessly lost and I am greatly indebted to him for saving me countless hours of wide-eyed panic and calculator drudgery. Dr. Katherine Koudele, as my advisor encouraged my pursuit of research in the equine world even though sending me to research at the dairy would have been much less of a hassle for her. Thank you for encouraging me to pursue my passions. Timber Ridge Camp and my wonderful director Charlie Thompson graciously allowed me to use horses and campers as part of my research while working. I love TRC and it will always be a second home to me.

**Figure 1.1**  
***Equine Temperament Evaluation Rubric***

	<b>Social</b>	<b>Fearful</b>	<b>Aloof</b>	<b>Challenging</b>
<b>Interaction</b>	Wants to observe and interact	Guarded or cautious	Not particularly interactive	Strong sense of self; in control
<b>Personal Space</b>	Tolerant of people or horses in personal space	May need more personal space; claustrophobic when confined	Tolerate but don't always welcome intrusion in space	Guarded or territorial about personal space; must be taught not to invade space
<b>Herd/Human Relationship</b>	Rarely at top of herd, but often second or friend of chief	Very dependent on social structure; likely to bond with another horse or human	May appear somewhat independent of both horses and people	Near top of herd; need constant clarification of place in social order/horse-trainer relationship
<b>Adaptability</b>	Generally accepting of new experiences	Not immediately at ease in a new situation	Generally accepting of new experiences;	Initially resistant to new suggestions
<b>Reactiveness</b>	Tend to underreact to new stimulus (not usually explosive)	May have strong, quick, or reflexive-type reactions to stimuli (overreact)	Generally not prone to explosive behaviors; show natural restraint	Prone to more explosive reactions
<b>Attention Span</b>	Short, trouble focusing in a busy environment	Once comfortable, often have long attention spans.	May appear to have a short attention span due to tuning out	If properly trained, will focus well with a good attention span
<b>Response to Training</b>	Steady performers; may need occasional tune-ups	Once trained, usually make strong efforts to comply	Once trained will need occasional reality checks	When properly trained make reliable, confident partners
<b>Lessons and Routine</b>	Appreciate variety in lessons	Prefer consistency; have trouble adjusting to multiple riders	Tolerates variety and routine fairly evenly.	Will challenge new ideas and unconfident riders
<b>Tolerance</b>	Tend to be more tolerant of inept or poor handling	Not tolerant of poor treatment	May tolerate poor handling but could resist responding to rider cues	Inept handling will likely result in loss of rider control
<b>Most content</b>	When allowed to interact with other horses, people and the environment	When in the reassuring presence of a stronger personality (human or equine)	When allowed ample alone time	When having their own way



**Figure 1.2**  
***Rider Skill-Level Evaluation Rubric***

	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Approaching the horse</b>	Unconfident or uncomfortable approaching the horse	Hesitant in approach, but exhibits elevated knowledge in how to approach	Confident, perhaps overly so, in approach; still lacking in refinement	Confident and comfortable in approach and knowledge
<b>Mounting &amp; Dismounting</b>	No knowledge of how to mount or dismount	Requires assistance or reminders in mounting or dismounting	Knows how to mount and dismount but still requires assistance	Mounts and Dismounts properly and with ease
<b>Basic Control</b>	No control; relies on mount's training	Knowledge of how to control mount but lacks ease of execution	Limited difficulty in communication with and control of mount	Demonstrates control and ease in communication with mount
<b>Balance and Seat</b>	Limited balance; incorrect and inconsistent seat	Moderate Balance; correct and consistent seat at walk	Moderate balance; increasing seat consistency and correctness at trot	Maintains balance and correct seat consistently at all gaits
<b>Hand Position</b>	Hands are positioned much too high or gripping reins too tautly/loosely	Hands positioned well but unsteadily, reins held at improper lengths	Hands positioned correctly consistently; and held fairly correctly	Hands near horse's neck, reins firm but supple
<b>Leg Position</b>	Leg position and grip inconsistent and incorrect	Knowledgeable of proper leg position but does not demonstrate consistently	Mastered the Heels down; leg position near consistently correct	Consistently correct leg position and grip
<b>Response to Instruction</b>	Does not heed any instructions	Attempts to comply with instruction but lacks ability	Attempts to comply with instruction and succeeds with limited difficulty	Complies with success in all instruction

**Figure 1.3**  
***Equine Misbehavior Categorization Outline***

0 (Not Ridden)	1 (No Incidents)	2 (Annoyance)	3 (Disruptive)	4 (Hazardous)
		Nipping, ear pinning, tail swishing, head tossing, mild shying, crowding, moving out of line	Balking, kicking, moderate shying, going off trail	Bucking, bolting, rearing, violent shying, repetitive kicking (more than twice in a row)

**Figure 2.1**  
***Equine Temperament Evaluation: Lady***

	<b>Social</b>	<b>Fearful</b>	<b>Aloof</b>	<b>Challenging</b>
<b>Interaction</b>	Wants to observe and interact	Guarded or cautious	Not particularly interactive	Strong sense of self; in control
<b>Personal Space</b>	Tolerant of people or horses in personal space	May need more personal space; claustrophobic when confined	Tolerate but don't always welcome intrusion in space	Guarded or territorial about personal space; must be taught not to invade space
<b>Herd/Human Relationship</b>	Rarely at top of herd, but often second or friend of chief	Very dependent on social structure; likely to bond with another horse or human	May appear somewhat independent of both horses and people	Near top of herd; need constant clarification of place in social order/horse-trainer relationship
<b>Adaptability</b>	Generally accepting of new experiences	Not immediately at ease in a new situation	Generally accepting of new experiences;	Initially resistant to new suggestions
<b>Reactiveness</b>	Tend to underreact to new stimulus (not usually explosive)	May have strong, quick, or reflexive-type reactions to stimuli (overreact)	Generally not prone to explosive behaviors; show natural restraint	Prone to more explosive reactions
<b>Attention Span</b>	Short, trouble focusing in a busy environment	Once comfortable, often have long attention spans.	May appear to have a short attention span due to tuning out	If properly trained, will focus well with a good attention span
<b>Response to Training</b>	Steady performers; may need occasional tune-ups	Once trained, usually make strong efforts to comply	Once trained will need occasional reality checks	When properly trained make reliable, confident partners
<b>Lessons and Routine</b>	Appreciate variety in lessons	Prefer consistency; have trouble adjusting to multiple riders	Tolerates variety and routine fairly evenly.	Will challenge new ideas and unconfident riders
<b>Tolerance</b>	Tend to be more tolerant of inept or poor handling	Not tolerant of poor treatment	May tolerate poor handling but could resist responding to rider cues	Inept handling will likely result in loss of rider control
<b>Most content</b>	When allowed to interact with other horses, people and the environment	When in the reassuring presence of a stronger personality (human or equine)	When allowed ample alone time	When having their own way
<b>Total</b>	2	10	0	0

**Figure 2.2**  
***Equine Temperament Evaluation: Beauty***

	<b>Social</b>	<b>Fearful</b>	<b>Aloof</b>	<b>Challenging</b>
<b>Interaction</b>	Wants to observe and interact	Guarded or cautious	Not particularly interactive	Strong sense of self; in control
<b>Personal Space</b>	Tolerant of people or horses in personal space	May need more personal space; claustrophobic when confined	Tolerate but don't always welcome intrusion in space	Guarded or territorial about personal space; must be taught not to invade space
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<b>Reactiveness</b>	Tend to underreact to new stimulus (not usually explosive)	May have strong, quick, or reflexive-type reactions to stimuli (overreact)	Generally not prone to explosive behaviors; show natural restraint	Prone to more explosive reactions
<b>Attention Span</b>	Short, trouble focusing in a busy environment	Once comfortable, often have long attention spans.	May appear to have a short attention span due to tuning out	If properly trained, will focus well with a good attention span
<b>Response to Training</b>	Steady performers; may need occasional tune-ups	Once trained, usually make strong efforts to comply	Once trained will need occasional reality checks	When properly trained make reliable, confident partners
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<b>Tolerance</b>	Tend to be more tolerant of inept or poor handling	Not tolerant of poor treatment	May tolerate poor handling but could resist responding to rider cues	Inept handling will likely result in loss of rider control
<b>Most content</b>	When allowed to interact with other horses, people and the environment	When in the reassuring presence of a stronger personality (human or equine)	When allowed ample alone time	When having their own way
<b>Total</b>	3	1	4	5

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